ICT Sector
in Barcelona

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Barcelona, the Mediterranean's innovation hub

EURO-MEDITERRANEAN REGION
CATALONIA
BARCELONA
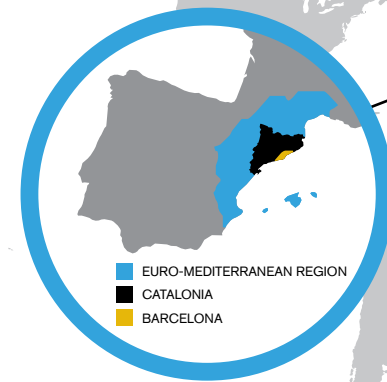
Barcelona, located in north-eastern Spain and on the shores of the Mediterranean, is one of the principal European cities and the centre of a vast metropolitan region of more than 160 towns, and with a population of more than 5 million people. It is the economic, cultural and administrative capital of Catalonia and the centre of an emerging area of economic activity in Southern Europe, with 17 million people and 800,000 businesses. The Euro-Mediterranean region, including the Balearic Islands, Valencia, Aragon and the south-east of France, is positioning itself in new strategic and internationally-competitive sectors, consolidating itself internationally as a major European metropolis.

With a long industrial tradition and a dense business fabric, Barcelona has a **highly diversified economic structure**. Its more traditional sectors coexist with new emerging ones, creating new clusters of knowledge that prioritise specialisation and competitiveness, focusing on internationalisation and creating a dynamic and innovative city economy. This has helped to drive Barcelona's strategic leadership in these fields.

In 2010, Catalonia was home to more than 3,400 international firms and received **36% of all annual foreign investment in Spain,** 90% of this concentrated in the Barcelona area.

Taking into account the distribution of gross value added across business activities, Catalonia is Spain's top autonomous region in the industrial sector, accounting for 25.2% of the total market. In terms of services, it is positioned second regarding national gross value added generated. Catalonia accounts for 28.2% of all Spain's companies in industries with high and medium high-tech and knowledge-based services.

Additionally, Barcelona's entrepreneurial activity rate in 2010 was 5.5%, above both the Spanish and European averages according to the Global Entrepreneurship Monitor (GEM) 2010.

Barcelona's international economic activities are mainly driven by the Trade Fair, the Port, Airport, the Zona Franca Consortium, Barcelona's Tourism Consortium, Barcelona City Council and its new technological innovation districts.

In addition, Barcelona is leading Spain's movement towards a knowledge economy. 29% of all companies and 48% of employees are working in sectors that are knowledge rich, in which ICTs play a major role. Regarding this last point, and given the importance of technology innovation for the competitiveness, productivity and internationalization of businesses, the information and communication technology sector (ICT) is one of the key sectors for Barcelona and Catalonia.

Catalonia has 3,349 ICT companies, a quarter of all ICT companies in Spain, which generate 20% of the national turnover in the ICT sector. **Almost 70% of ICT companies are located in the province of Barcelona,** and these mainly have fewer than 50 employees and focus on providing ICT services and developing quality software.

The high capacity, security and reach of ICT infrastructure available in Barcelona and its metropolitan area have positioned the Catalan capital at the forefront of Mediterranean countries. These, and other reasons, have helped **Barcelona get nominated the world capital of mobile telephony until 2018.**

10 reasons to invest in Barcelona

Barcelona offers a number of different elements that make it an attractive place to live, work and do business. Today the city is a highly interesting location for new economic activities. Some good reasons to invest here are as follows

01. Strategic geographic location

Two hours by road from France and one day from the main European cities. The gateway to Southern Europe and capital of the Union for the Mediterranean, Barcelona's port, airport, logistics parks, international trade fairs and city center are found within a five-kilometer radius.

02. Comprehensive transport infrastructure

A network of motorways connected to Europe; the fastest growing airport in Europe; the top Spanish port and largest container port in the Mediterranean; wide reaching underground, train and bus networks; high-speed train connections to the European rail network as of 2013.

03. Center of a large, dynamic and diverse economic area

The Barcelona area has nearly 5 million inhabitants. It is the capital of Catalonia, with 7.5 million inhabitants, and the center of the Mediterranean Basin, an economic area with 18 million inhabitants. It accounts for 70% of Catalonia's GDP, and is the sixth largest urban area in Europe and has the fifth highest concentration in Europe in terms of industry. Catalonia has nearly 7,000 businesses working in innovation related activities, most of which are located in Barcelona and its surrounding area.

04. Successful foreign investment

Barcelona is ranked the 6th best city in Europe for business*, and Catalonia accounts for approximately 36% of all foreign investment in Spain and is home to more than 3,400 foreign companies, 90% of whom are located in the Barcelona area.

05. Internationally renowned positioning

Barcelona tops a number of international rankings, which rate its urban environment, ability to attract foreign capital, entrepreneurial spirit and quality of life very highly.

*According to Cushman & Wakefield, European Cities Monitor 2011.

06. Human resources prepared for the future

Barcelona now has one of the leading labour markets in Europe in terms of critical mass in high value-added sectors; highly productive, one of the best in Europe according to the OECD; 8 public and private universities; a number of prestigious business schools including ESADE, IESE and EADA; 34 international schools; widespread use of new technology and a natural tendency for innovation and creativity.

07. Excellent quality of life

For the 14th year running, Barcelona boasts Europe's best quality of life for employees*. It has a mild climate, sun, beaches, culture, splendid leisure time and arts programmes, a network of 4,500 educational institutions, modern and accessible health system. It is easy to get around on the public transport system and boasts beautiful parks that surround the city.

08. Large-scale urban-planning projects for the future

Transformation of 1,000 ha and 7 million m^2 of floor space in the metropolitan area of Barcelona.
Llobregat Area: commitment to logistics, aerospace and mobility, with expansion of the port and airport.
Besòs Area: urban renewal, universities and research and innovation centers; Porta Europa-La Sagrera: arrival of the high-speed train; 22@Barcelona: the new technology and innovation district, and the Diagonal-Besòs Campus for activities related to energy, water and sustainable mobility.
Vallès Area: strategic concentration of technology, nanotechnology and research facilities; the Alba Synchrotron, the Vallès Technology Park and the UAB Research Park.

09. Competitive real estate market

Wide range of offices, retail spaces and industrial warehouses with excellent price/quality balance and a high occupation rate.

10. Unique public/private cooperation

Barcelona City Council and the Catalan Government are highly committed to companies; the success of traditional public/private collaboration has been key to Barcelona's transformation.

ICT, a strategic sector for Barcelona and Catalonia

The Information Technology and Communications sector (ICT) is one of the key business areas for Barcelona and Catalonia, both in terms of what it represents for the city itself, but also what it does for improving companies competitiveness and better use of ICT.

In recent years, Barcelona, like other advanced economies in the world, has put a great deal of effort into promoting ICTs, making it a strategic sector for the future of the city's business power and its social make-up, and marked by the globalized economy and the rising demand for social services aimed at citizens.

Thanks to this initiative, the Barcelona area now has more than 2,150 ICT[1] companies, 210 technology parks, technology centres and research facilities, and 9 international scientific benchmark facilities like the Barcelona Supercomputing Centre –or the National Microelectronics Centre's Sala Blanca[2].

Catalonia accounts for a quarter of all IT companies in Spain and generates 20% of national turnover in the ICT sector[3]. The core of ICT activities in Catalonia and Barcelona is based around a pool of small and medium-sized businesses designed to provide ICT services and develop quality software. The size of ICT businesses in Barcelona, driven by an

enterprising Catalan spirit, means that the city benefits from a higher degree specialization, flexibility, and adaptability to highly dynamic environments.

## Distribution of businesses in the ICT sector, by subsector, 2009
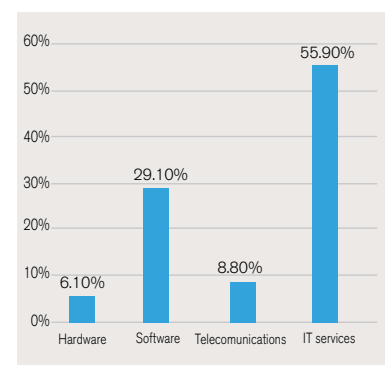
Source: FOBSIC

Despite the economic situation in the world and a certain decline in productivity in 2009, the Catalan ICT sector has shown considerable strength and a spirit of improvement. In 2010, turnover reached nearly 14 billion Euros, a figure similar to 2008[4].

ICT business sales volume (millions), 2009
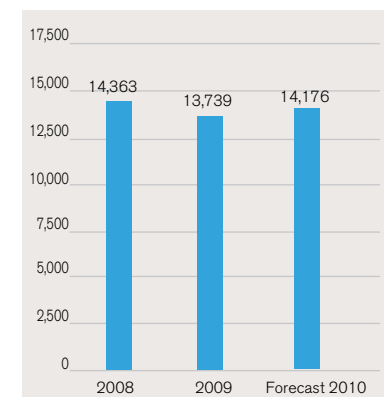
Source: FOBSIC

On the other hand, Barcelona is leading Spain's progress in the knowledge economy sector. 29% of companies and 48% of the city's employees are working in knowledge-based sectors, where ICTs play a major role[5]. A strategic commitment to move towards an economy based on knowledge and creativity has brought about significant progress. Especially outstanding is Barcelona's 15th place in the world ranking of

scientific production, while in terms of Europe, it was placed 6th [6].

Firms' innovation capacity is the cornerstone of the knowledge-based economy. The ICT sector is the most innovative in Catalonia and Spain. 80.8% of ICT companies in Catalonia have introduced some form of innovation activity during the last two years -clearly higher than innovation carried out in other sectors, which on average stands at one third of companies.

Regarding workforce availability, Catalonia has more than 110,000[7] highly-trained ICT professionals capable of developing technology-based projects and generating world- leading projects.

10 reasons to invest in the ICT sector in Barcelona

01 Leader of southern Europe in ICT take-up

02 Availability of ICT infrastructure

03 Concentration of ICT companies

04 Networks to support research and technology transfer

05 Centre of talent, creativity and entrepreneurship in Southern Europe

06 Commitment of public institutions to ICT promotion

07 Tradition of collaboration

08 Barcelona, a laboratory for innovation

09 City of congresses and world capital of mobile telephony

10 Ideal city for ICT business

[1/3] Observation Foundation for the Information Society in Catalonia (FOBSIC). The ICT business sector in Catalonia, – Structure and value elements in ICT companies in Catalonia –

[2] Barcelona City Council, Economy, Business and Employment Area, Barcelona Datasheet 2011

[4,5,7] FOBSIC, The ICT business sector in Catalonia, – Structure and value elements in ICT companies in Catalonia –

[6] Barcelona City Council, Economy, Business and Employment Area, Barcelona Datasheet 2011

The top 10 strong points of Barcelona and Catalonia's ICT sector

BARCELONA CITY

MEDITERRANEAN SEA

Public Wi-Fi network map
Source: Barcelona Municipal Institute of Information Technology (IMI)

01.
LEADER OF SOUTHERN EUROPE IN ICT TAKE-UP

Barcelona is a highly-modern city regarding ICT take-up. With higher values than the average in Catalonia, Barcelona has one of the highest rates of ICT adoption both in businesses and at home, but also on the development of eGovernment.

Currently, the use of new technologies is essential for the majority of Catalan companies, with a significant and gradual adoption by micro firms, as reflected in data from 2010: With 98% of companies connected to the Internet, Catalonia has a higher rate than the average for Spain (97%) and Europe EU15 (95%) and is now positioned as one of the Mediterranean's most open regions. The quality of internet access is also better, with almost all firms using broadband Internet access (specifically, 98.9% of companies with 10 or more employees and 97.2% of micro-enterprises), rates that are higher than the average for Europe (UE15)[8], standing at 93%.

The public administration's commitment to provide quality telecommunications networks throughout the country means that mobile broadband adoption rates in Catalan companies has already reached 42.2% of companies with more than 10 employees and 21.2% of micro firms, a rate that is well above the

Spanish average (34%) and the European EU-15 average (30%).

The City Council is a clear example of *eGovernment*, with projects such as *eTràmits* and *l'Expedient Electrònic*, both designed to simplify administrative processes and provide end-to-end digital services to minimize the interactions of citizens and businesses with government. In 2009, 1.2 million procedures were carried out online, representing 37% of the total volume of transactions during 2009[9].

But the use of ICT is not unique to companies. Catalan people are used to incorporating modern technology into their daily lives. Virtually all homes in Catalonia (95.1%) have a cell phone, and 73.1% have a computer and 67.2% have broadband internet[10].

These values are above the Spanish and European UE-15[11] averages.

[8] FOBSIC, The ICT business sector in Catalonia, – Structure and value elements in ICT companies in Catalonia –
[9] Barcelona City Council
[10] FOBSIC, Survey on the facilities and use of Information Communication Technologies (ICT) in homes in Catalonia (2010) – Volume and facilities (ICT)
[11] ONTSI, Annual Report on the Information Society in Spain 2009 (2010 Edition)

02.
AVAILABILITY OF ICT INFRAS-TRUCTURE

Scientific and technology facilities (ICT) are crucial for research and innovation systems, for developing business competitiveness and for facing existing and future social challenges. Barcelona and its metropolitan area offer tremendous ICT capacity, security and diversity that have positioned the city it ahead of others countries in the Mediterranean.

Specifically, the city has the following facilities:

- **Optics Network:** Barcelona has a network of 325 km of fibre optics and other complementary infrastructure.

- **Corporate Network:** Barcelona has a closed broadband infrastructure, most with 1 Gbps links, which covers council-related groups.

- **Municipal Wi-Fi network:** The municipal Wi-Fi network complements the corporate network's connectivity, and provides workers and services throughout the city. The council Wi-Fi network consists of 469 active nodes, reaching 30% of the city.

The development of broadband brings faster and more automated information flows between companies, which improves competitiveness. With this in mind, the autonomous regional Government has recently created so-called **"Ring Sectors."** So far, the Catalan Government has developed different ring sectors:

| 01 Industrial (automotive) |
| 02 Culture |
| 03 Audiovisual |
| 04 Logistics |

A feasibility analysis is also underway regarding a **Foodstuff Ring**, which will be geared to one of the strategic segments in the sector.

As well, several rings have been launched aimed at public sectors and services:

| 01 Science |
| 02 Health |
| 03 Education |
| 04 Inter-Administration |

Thanks to high speed national and international network connection infrastructure, such as fibre optics, and access to benchmarking scientific and technical facilities, like the Barcelona Supercomputing Centre, and other tools that facilitate collaboration, Catalonia is providing different business sectors with tools that can help develop competitiveness in their business area, and at the same time also strengthen the Catalan ICT sector.
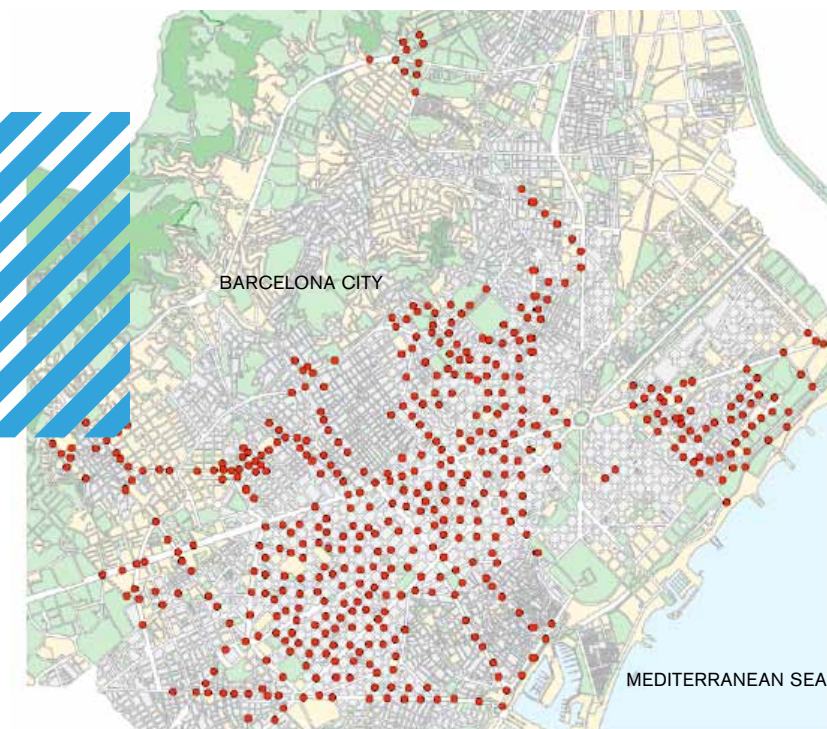
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03.
CONCENTRATION
OF ICT COMPANIES

Catalonia has 3,349 companies in its ICT sector, a quarter of all IT companies in Spain, generating 20% of national turnover in the ICT sector[12]. Almost 70% of companies in the ICT sector are located in the province of Barcelona, and site-wise, they are mainly concentrated in technology parks and enterprise zones like 22@ Barcelona, Barcelona Technology Park, the UAB's research park or Tecnocampus Mataró - Maresme.

[12,13] FOBSIC, *The ICT business sector in Catalonia, – Structure and value elements in ICT companies in Catalonia –*

The corporate structure of the ICT sector in Catalonia is dominated by small businesses with fewer than 50 employees, providing ICT services and developing quality software. The highly-innovative nature and talent required in the ICT sector has allowed Catalonia to create a very specialized sector, with the ability to offer complementary products and services that can satisfy the current demand for diversified ICT products and services both locally and outside Catalonia. Approximately 45%[13] of ICT companies in Catalonia have another office outside Catalonia.

Thanks to their talent and the entrepreneurship systems in Catalonia, there are some fine examples of small companies that have managed to become international benchmarks, like:

- Privalia, a company founded by Lucas Carné and José Manuel Villanueva, which is a private site for internet purchases and one of the most successful in the world. One of

the keys to its success is the ability to buy branded clothing at very affordable prices.

- Spamina, created by Catalan entrepreneur Dídac Lee, develops and provides innovative solutions for email security in Cloud, Hybrid and Private Cloud Computing environments. It has offices in Europe and America and partners worldwide.

- Digital Legends Entertainment, created by Xavier Carrillo, is revolutionizing the video game industry and specializes in the development of games for mobile platforms.

Driving this ICT sector -that is primarily made up of SMEs- Barcelona is the main location for those big international IT companies that have opted for the Catalan capital to boost their business. They also energize and strengthen the ICT sector in Catalonia. Examples of these large IT companies that have set up in Catalonia include:

- Abertis Telecom, European leader in infrastructure management and telecommunications services. Together with Indra, they plan to create a benchmark centre in Barcelona as part of the "Smart Cities" framework.
www.abertistelecom.com

- Cisco Systems, lworld leader in network solutions and Internet infrastructure. Along with Barcelona City Council, they will develop a benchmark urban architecture platform, a basic element in the Barcelona 2020 vision.
www.cisco.com

- Fujitsu, is the world's third largest IT company, the fourth largest global provider of technology services, and the first in Japan.
www.fujitsu.com

- Hewlett-Packard, Hewlett-Packard's international centre in Barcelona will concentrate all the multinational's marketing in the area

of image and printing for Europe, the Middle East and Africa (EMEA).
www.hp.com

- IBM, has an IBM Innovation Centre in Barcelona specialized in solutions for banking. This centre is part of a network of 40 innovation centres that IBM has spread across 32 countries.
www.ibm.com

- Indra, this leading IT company has a centre of excellence located in the 22@Interface Building in Barcelona, and in Lleida they are developing a software lab. Together with Abertis Telecom, they plan to create a benchmark centre in Barcelona as part of the "Smart Cities" framework.
www.indracompany.com

- Microsoft, has set up its headquarters for a IFR Software Factory for Microsoft Dynamics in Catalonia, and in 2006 it created the Innovation Productivity Centre in central Catalonia.
www.microsoft.com

- Telefónica R&D, is the research and development wing of the Telefónica Group. Telefónica R&D is one of the top private R&D activities and facilities in Spain.
www.tid.es

- T-Systems, part of the Deutsche Telecom group, was one of the pioneering companies that set up in 22@Barcelona. There, have their headquarters for the Iberian Peninsula, providing ICT infrastructure and services to multinational companies and public institutions.
www.t-systems.es

- Yahoo! Research Barcelona, located in 22@Barcelona, is the Yahoo's European research laboratory focusing its work on data mining on the Web, in close collaboration with the Pompeu Fabra University (UPF) in Barcelona.
http://research.yahoo.com/

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Barcelona Supercomputing Centre - National Supercomputing Centre

04.
NETWORKS TO SUPPORT RESEARCH AND TECHNOLOGY TRANSFER

Centre for Science Services and Academics in Catalonia (CESCA)
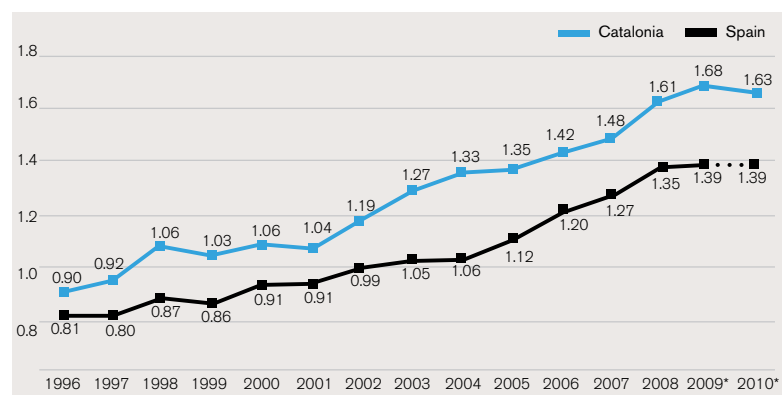
Catalonia is Spain's most important setting for science, and also a leader in the Mediterranean. In 2009, some 3.284 billion Euros was invested on R&D[14] here, representing 1.68% of national GDP[15]. Its R&D production represents almost a quarter of all production in Spain, and nearly 1% of the world's production, similar to countries like Finland or Scotland[16]. There has been a strategic commitment to move towards a knowledge based economy and this has allowed Barcelona to position itself in 15th place in the world rankings of science production and sixth at the European level.

[14] INE
[15] Research observatory
[16] ACC1Ó
[17] CERCA
[18] CDTI

Evolution of spending on R&D as a percentage of Catalonia and Spain's GDP

	Catalonia	Spain
1996	0.90	0.81
1997	0.92	0.80
1998	1.06	0.87
1999	1.03	0.86
2000	1.06	0.91
2001	1.04	0.91
2002	1.19	0.99
2003	1.27	1.05
2004	1.33	1.06
2005	1.35	1.12
2006	1.42	1.20
2007	1.48	1.27
2008	1.61	1.35
2009*	1.68	1.39
2010*	1.63	1.39

* Data 2009 and 2010 for Spain calculated with respect to base 2008 GDP   *Source: INE*

Barcelona and Catalonia's clear commitment to research and technology transfer as a source of business competitiveness is mirrored by significant growth in R&D spending, both public and private, over the past 10 years. Specifically, in just the last 2 years, investment in research and development has increased nearly 13%, with public investment in R&D especially noteworthy.

Catalonia has an extensive support network for research and technology transfer. Specifically:

- TECNIO Network:
the TECNIO network boasts more than 100 agencies and 3,000 researchers, and in 2009 it recorded a turnover of over 146 million Euros, creating 10 new spin-offs.

- CERCA Centres:
includes 39 centres of excellence dedicated to research in Catalonia. In 2009, CERCA centres' turnover was 187.5 million Euros, with the support of more than 2,750 researchers.

- Science and Technology Park Network (XPCAT):
brings together large areas of knowledge production, transfer, and in general, knowledge use, and XPCAT also acts as point of contact for the research and innovation community.

Thanks to Government support and Catalonia's excellent R&D centres, the country's researchers have been able to capture approximately 2%[17] of the European Union's 7th Framework Programme finances for R&D, an amount which is far higher than its weight in terms of population, and which makes Catalonia Spain's most active region in terms of leading 7th Framework Programme activities (149 in 2009)[18], in other words, in over 35% of those activities led by Spain.

Specialized ICT research centres:

Barcelona Digital Technology Centre
www.bdigital.org

Barcelona Media Innovation Centre (CIMB)
www.barcelonamedia.org

Catalonia Technological Centre (CTTC)
www.cttc.es

i2CAT Foundation
www.i2cat.net

Scientific facilities internationally recognized:

Barcelona Supercomputing Centre - National Supercomputing Centre
www.bsc.es

Marine Research and Experimentation Channel
http://ciemlab.upc.edu/

International Centre for Numerical Methods in Engineering
www.cimne.upc.es

Computing and Communications Centre of Catalonia
www.cesca.es

Structural Biology Proteomics Facility
http://ibb.uab.es/ibb/

Laboratory for Nuclear Magnetic Resonance Scans
http://www.rmn.ub.es/lrb/

Plataforma Mouse Clínic
www.imb-cnm.csic.es

Synchrotron (ALBA)
www.cells.es

The top 10 strong points of Barcelona and Catalonia's ICT sector

05.
CENTRE OF TALENT, CREATIVITY AND ENTREPRENEUR-SHIP IN SOUTHERN EUROPE

The Scorecard on Prosperity 2010 publication (Toronto Board of Trade) puts Barcelona in third place in the overall world prosperity ranking ahead of metropolitan areas like San Francisco, Paris, Madrid, Hong Kong and Seattle. Recently, Catalonia received the Entrepreneurial Award 2010, awarded by the Committee of Regions, a European Union agency. Moreover, Catalan people are talented, creative and have an incredible capacity for work, with such virtues seen in the likes of Ferran Adrià, Antoni Gaudí, Salvador Dalí and Montserrat Caballé.

[19] Global Entrepreneurship Monitor (GEM) Catalonia 2010
[20] AEBAN, 2010
[21] FOBSIC, The ICT business sector in Catalonia, – Structure and value elements in ICT companies in Catalonia – IESE Business School headquarters

The culture of innovation is deeply rooted in our region, with the relative amount of innovation distributed equally between SMEs and large companies. 80.8% of Catalan ICT companies have introduced some form of innovation in their businesses over the past two years.

Catalonia boats a tremendous entrepreneurial spirit, according to data from the 2010 Global Entrepreneurship Monitor (GEM), which shows that the rate of entrepreneurial activity (APR) in the province of Barcelona is 5.5%, higher than the Spanish and European averages[19].

Barcelona has a variety of organized Business Angel networks (Business Angels Network Catalonia, BCN Business Angels, networks of investors at IESE andESADE, SeedRocket, Eix Technova, Keiretsu,…), as well as seed, growth and risk capital funds, (Emprendedor XXI, Nauta, and BCN Empren,….). These provide the intelligent capital needed to cover financial needs, whilst offering support during the process of creating and

consolidating new companies that have an international projection. The commitment of private investment to new businesses is reflected by the amount of active Business Angel networks actively investing in this region, which in fact represents 40% of the supply in the whole of Spain[20].

Barcelona City Council promotes new business creation via the local development agency Barcelona Activa, it provides entrepreneurs with contacts and innovation areas with quality services and facilities.

This support process is rounded off with incubators for innovation, quality services and facilities, such as:
- **Glòries Business Incubator**
- **BCN Nord Technology Park**
- **Almogàvers Business Factory**

30 local incubators in the Barcelona area and the rest of Catalonia:
- **Esade Creàpolis:** it host more than 50 companies from different sectors.
- **Technova:** it hosts 16 companies.
- **Barcelona Technology Park:** it hosts 30 ICT companies.
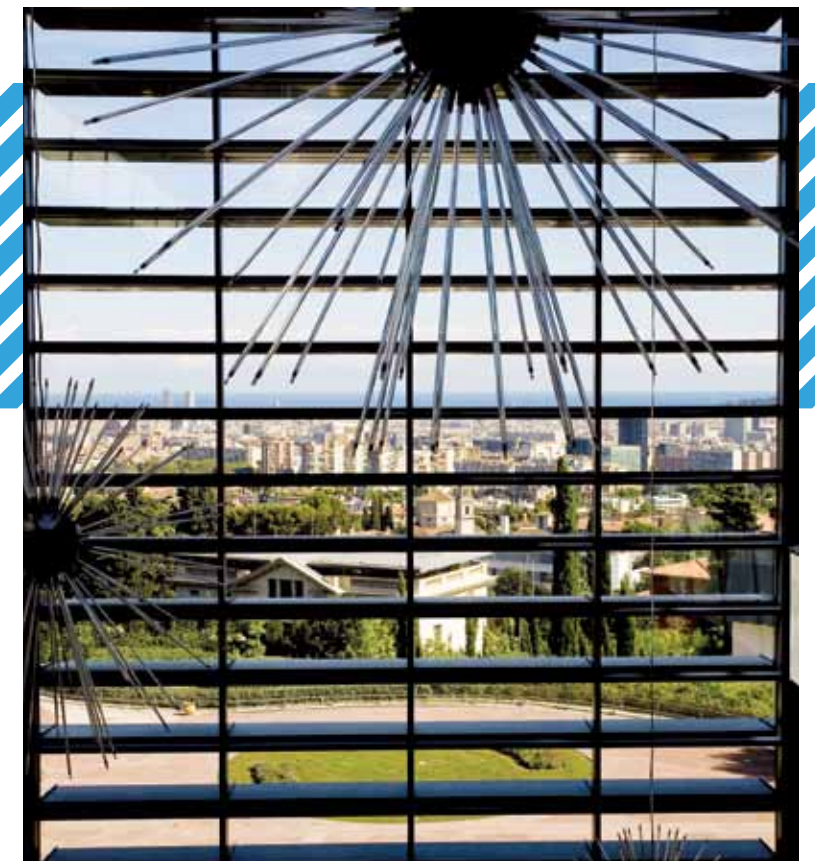
Creativity in art, science and entrepreneurship has made Catalonia a benchmark worldwide.

So, it is not surprising that Barcelona leads advances in the knowledge economy, **with 29% of companies and 48% of employees in the city working in knowledge-based sectors.**

Catalonia's university system, made up of 12 public and private universities and a range of 400 different degrees on offer, is one of the drivers generating and attracting talent for Catalonia, and, in the Spanish context, it attracts far more graduate and doctoral students. According to the Times Higher Education Rankings, the University of Barcelona (UB) and the Pompeu Fabra University (UPF) are among the best 200 universities worldwide.

Regarding graduates from the Catalan university system, 13.8%[21] obtained an ICT-related bachelor's degree (telecommunications, computer, electronics or audiovisuals). The percentage of graduates in ICT is one

of the most significant features of the demographic configuration of ICT professionals in Catalonia and makes in this group one of the best prepared in Spain, and significantly different to the overall economy.

Currently, 62% of Catalonia's 110,000 ICT professionals have university degree-level studies and they represent 3.48% of all employees in Catalonia. In recent years, the percentage of IT professionals has increased and now stands at a rate which is slightly higher than the European average.

The technological expertise of ICT professionals is complemented by excellent business schools located in Barcelona, like ESADE and IESE, which provide experience in business management and strengthen the creation of technology-based companies and innovation based on information technologies. According to the Financial Times, in 2010 ESADE and IESE were amongst the top 10 business schools in Europe.

The availability of highly-qualified and multilingual personnel from prestigious universities, and the Catalan capital's vibrant and cosmopolitan character were the main reasons why over 3,400 foreign companies have settled in Catalonia to establish their new technology projects.

Following a growth model based on the knowledge-economy and creativity, in 2009 Catalonia saw its research community rise to a total of 47,324 employees dedicated to research and development. In this community, 40 researchers have received funding from the European Research Council's (ERC) Starting Independent Researcher Grants and Advanced Investigators Grants until 2009, a significant number bearing in mind that the rest of the Spain has obtained 26 such grants. This excellent team of international researchers means that the province of Barcelona generates 15% of applications and 22.4% of Spain's utility models.

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06.
COMMITMENT OF PUBLIC INSTITUTIONS TO ICT PROMOTION

In recent years, public authorities at the local, national, state and international level have shown their support for developing policies aimed at boosting the knowledge economy and the ICT sector as a motor for innovation and growth.

The development of these policies has expanded the range of services for citizens, increasing the usage rate of ICTs by businesses, strengthening the ICT sector and helping Catalonia to generate highly innovative projects for the world, as presented during the World Mobile Congress.

Main programmes being developed by different public administrations in order to promote the knowledge economy:
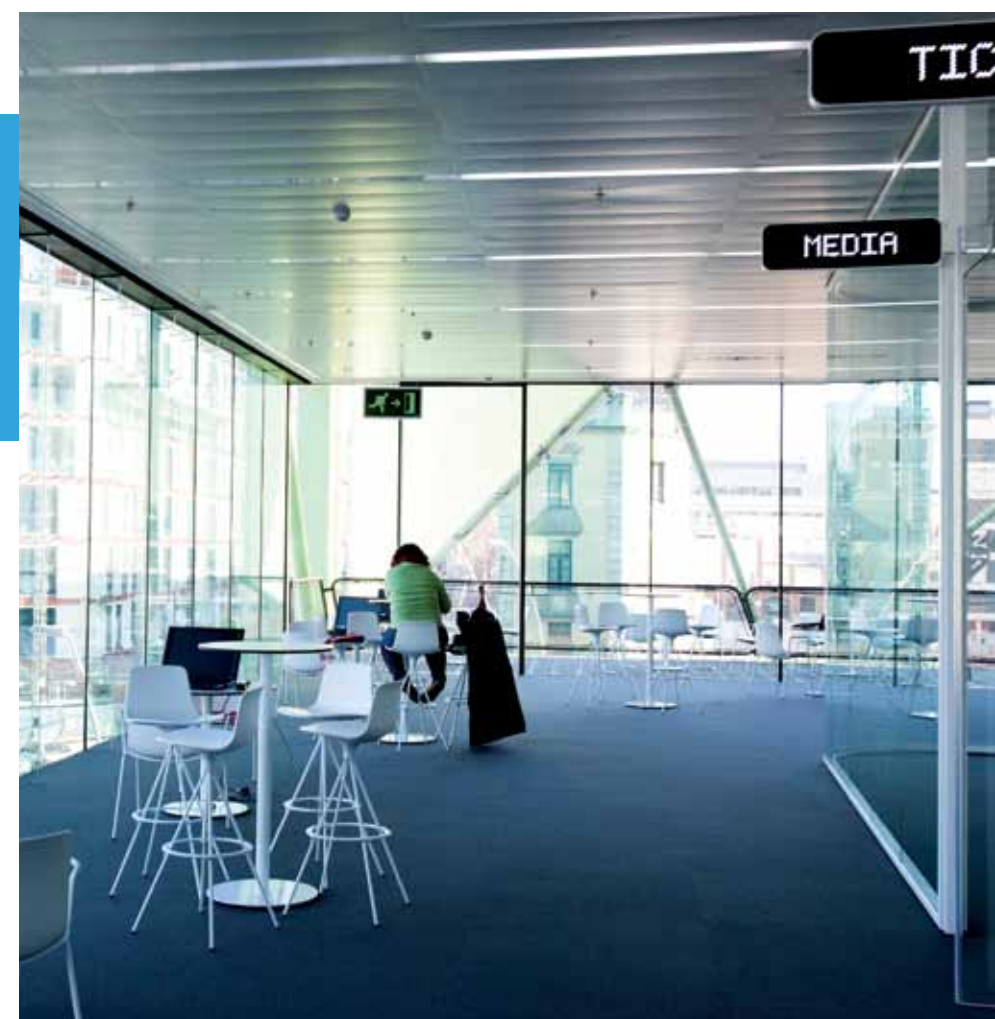
Barcelona:
- **Barcelona City Council:** In recent years the City Council has made a clear commitment to the ICT sector as a driver of business competitiveness and as a tool to serve the citizens better. The main lines promoted by the City Council have been: the modernization of municipal infrastructure technology, the development of eGovernment projects, an open data project, and Barcelona's bid to become a world benchmark Smart City.

- **22@Barcelona:** is an innovation district offering modern spaces for the strategic clustering of knowledge-intensive activities. 22@Barcelona supports innovation and access to technology through initiatives such as Barcelona Urban Lab, and cluster promotions in ICT, Media, Medical Technology (TechMed), Energy and Design.

- **Barcelona Activa:** is the City Council's local development agency. It has become a leader in local and international support programmes for entrepreneurs, innovation, professional development and job creation.

- **Cibernàrium:** offers training programmes and promotes technology on behalf of Barcelona Activa - City Council. It provides training for professionals and companies, as well as Internet training for beginners.

- **Chamber of Commerce:** offers support for innovation, internationalization, training and foreign

direct investment in the city, whilst generally encouraging the promotion of economic and business activity in the region.

- **Barcelona Digital Technology Centre:** ICT technology centre that contributes significantly to the promotion of ICT use in business and in general society in Catalonia.

Catalonia:
- **ACC1Ó:** is an agency that develops the competitiveness of Catalan business. It specializes in fostering the innovation and international business and has a network of 34 offices worldwide.

- **Directorate General of Telecommunications and the Information Society (DGTSI):** has the objective of extending and facilitating access to telecommunications networks to the entire population of Catalonia, while contributing to the development of the information society, strengthening and consolidating the Catalan ICT sector.

- **Localret:** is a consortium made up of local administrations in Catalonia and designed to support the development of telecommunications network services, as well as the application of ICT in order to enhance local government objectives in promoting a knowledge society.

- **Inter-departmental Commission for Research and Innovation (CIRI):** aims to develop, define and coordinate government strategies and policies in research and innovation.

Spain:
- **Ministry of Industry, Energy and Tourism:** the driving force behind Avanza Plan, a programme to promote the knowledge society via the incorporation of ICT in business.

- **Ministry of Economy and Competitiveness:** promotes a programme called INNPACTO, which aims to encourage the creation of cooperation projects between research institutions and companies to promote

innovation, create jobs and improve the balance of technology across the country.

- **Centre for Industrial Technological Development (CDTI):** is a public business entity, part of the Ministry of Economy and Competitiveness, which promotes innovation and technology development in Spanish companies.

The top 10 strong points of Barcelona and Catalonia's ICT sector

Media-TIC building, Barcelona Digital Tecchnology centre Headquarters

07.
TRADITION OF COLLABORATION

Catalan ICT companies' collaboration with other national and international companies has fostered improvements in the areas of joint funding, training, innovation and the business competitiveness of those companies involved.

Clusters are groups of companies and organisations that can create sinergies in a business area and related fields, improving competitiveness through the interaction of its stakeholders. To make a cluster that acts as a vector in a certain area there should be a number of factors that Barcelona has: on the one hand, there has to be a lot of young entrepreneurial companies, which provide the cluster an innovative drive, and on the other hand, there should be a consolidated group companies prepared to re-invest some of their profits in promoting and encouraging research and investigation, like in the case of Catalonia. Finally, there should be a solid range of internationally recognised educational institutions that facilitate knowledge transfer between universities, research centres and business, while providing highly qualified human resources.

In addition, Barcelona has the support of public institutions that promote the right policies, and environments

that can promote entrepreneurship, attract talent and protect intellectual property.

Following international models, and using cluster policy experiences developed in Catalonia since 1993, various public authorities (mainly the City Council, DGTSI and ACC1Ó), in collaboration other institutions and organizations, like the Chamber of Commerce or 22@Barcelona, have launched several projects aimed at stimulating ICT clusters. These clusters, which are at different development stages, demonstrate a clear strategy commitment to promoting a strong and leading Catalan ICT sector both at home and internationally:

- ICT Cluster at Barcelona Digital. The ICT cluster at Barcelona Digital brings together about 60 ICT firms mainly from the metropolitan area of Barcelona (companies, associations, chambers of commerce and technology centres). This cluster aims to boost the competitiveness of Catalonia's ICT sector, promoting a

new business culture based on collaboration and open innovation. The initiative is promoted by Barcelona Digital Technology Centre and 22@Barcelona.

- Cluster Security: This cluster is made up of more than 120 ICT companies (products, integrators, VAR, projects and retailers) and institutions (universities, technology centres, business organisations, support organisations) involved in the field of information security. The initiative is promoted by the Chamber of Commerce and the Information Security Centre of Catalonia (CESICAT) with the support of Generalitat of Catalonia.

- Mobility (Clúster6m): Clúster6m contains more than 100 companies (navigation and positioning solutions, vehicle communications, mobile devices and applications, integrators) and institutions (research centres, universities and government) in order to carry out projects that improve mobility, business competitiveness and the welfare of citizens. The initiative, promoted by the city councils of the Delta area (El Prat de Llobregat, Sant Boi de Llobregat, Viladecans, Castelldefels and Gava) has the support of the Generalitat of Catalonia and Barcelona's Provincial Government.

- Sensors and intelligent cities: The incorporation of ICT in the design, planning and management of urban spaces and services in cities are key tools to face future challenges in cities, generating new business opportunities for the ICT sector. As such, a new cluster of ICT companies related to the world of sensors and intelligent cities is being developed and which currently includes about 100 companies (sensors, communications networks and applications, street furniture and equipment, and services) and institutions (local administrations, universities and technology centres, support organisations). The initiative is being promoted by i2cat Foundation, with support from the Generalitat of Catalonia

- Education (LogosNet): is an initiative promoted by CETEI-Fundació Joan XXIII (Ituarte Technologies Centre) Bdigital Technology Centre with the support of ACC1Ó, the Ministry of Telecommunications and the Information Society at the Generalitat of Catalonia and Barcelona City Council (22@). The initiative aims to improve the competitiveness of ICTs and education in Catalonia by trying to understand the ICT needs of the education sector and, moreover, strengthening the competitiveness of companies in the sector.

- Health: More than 200 companies (consulting, computer services, medical equipment, communications, application developers, etc.) and institutions (groups of hospitals, health centres, technology centres, public administrations) form part of the TicSalut Business Council Foundation that, with the support of the Generalitat of Catalonia, generates promotion strategies in the sector and networking across the health field.

One of the key factors of Catalonia's ICT development that can ensure the success of a cluster policy is its long-standing associative tradition, collaboration and networking capacity. Two out of three companies are involved in a Catalan ICT association[22]. These traits have helped Barcelona, for example, become a leader regarding the number of collaborative projects carried out as part of the 7th Framework Programme in Spain and in Southern Europe.

[22] FOBSIC, The ICT business sector in Catalonia, – *Structure and value elements in ICT companies in Catalonia* –

The top 10 strong points of Barcelona and Catalonia's ICT sector

08.
BARCELONA, A LABORATORY FOR INNOVATION

Barcelona is the best region in the Mediterranean to test new products and technology services because it has the necessary infraestructures, skilled and multilingual staff, and the right concentration of IT companies, institutional support and a recognized experience of being a "real lab".

According to the report "The new nature of innovation" by the Finnish and Danish Governments on innovation strategies across the OECD in 2010, the process of innovation is changing. Innovation is coming outside of companies' R&D+i departments and it is starting with users, giving them the opportunity to actively participate in the development of new products and services.

Catalonia has been a pioneer in this respect, with strategies involving users at every stage of the innovation process in real environments already in place for over 5 years via different Living Labs located in Catalonia.

Barcelona has been a leader in the creation of Living Labs and it is the Southern Europe's most active region in this area. The main Living Labs network in Catalonia, called CatLab, is part of the European Network of Living Labs (ENOLL), an international benchmark in the Living Labs field, and has 212 members. CatLab

is coordinated by i2cat and has been involved in 7 Living Labs (Barcelona Digital i2cat, Barcelona Urban Lab, Citilab Cornella, Neapolis-Vilanova, Tecnocampus-Mataró and Guifinet).

Some projects executed under the Living Lab concept:

- SIIUR: The SIIUR Living Lab project is an urban pioneer and innovator in the intelligent management and efficient use of public lighting and the integration of municipal services via this infrastructure. SIIUR, part of the SmartCity concept, is being carried out in passage Mas de Roda in the 22@Barcelona district.

The city of Eindhoven chose the SIIUR project as one of five finalists from over 245 entries in the open Living Labs Global competition in order to develop and implement innovative intelligent lighting and sustainability solutions in one of the city's main districts.

- Real-time Medical reporting service: The main objective of REMEI, an i2cat sponsored Living Labs project, is the implementation of shared-medical-report solutions in real time between specialists from different medical centres solving emergency situations.

- Edulab: This initiative, led by Citilab Cornella, is a laboratory for the educational community. It aims to foster innovation in teaching and learning through the use of information technologies and specific communication methodologies.

- Project ICING: 8 cameras using artificial vision systems were installed as part of the Barcelona Urban Lab to count the number of vehicles travelling on city streets. This pilot is part of the ICING European project involving 10 companies.

- Project MOVELE Barcelona: As part of the MOVELE project promoted by the Institute for Diversification and Energy Saving (IDAE), this project involves deploying a network of

190 re-charging points for electric vehicles for users in underground and surface car parks across the city and which are run via different promoters yet interoperable. The promoter of this initiative is the City Council's Department of Transport.

- Barcelona City Council's Open Data Project: In March 2011, the City Council launched the Barcelona Open Data project. This project is about making public data that the city has -at any aggregation level- available to the public to increase the transparency of council management, to encourage the social use of public data, and to boost business and innovation.

Complementing Living Lab initiatives and located in the 22@Barcelona district, Barcelona boasts a unique building called Media-TIC, which was designed using the values of sustainability and the digital world. In this ICT building coexist training, research, technology innovation, production and ICT promotion activities. The building is an excellent networking space,

a laboratory-come-showroom that allows IT companies to show and demonstrate their most innovative products and services. The Open University of Catalonia (UOC), Barcelona Digital Technology Centre, the new headquarters of Cibernàrium and other IT companies and professionals currently occupy the Media-TIC building.

Location map of cameras used in the ICING project

The top 10
strong points of
Barcelona and
Catalonia's
ICT sector

09.
CITY OF CONGRESSES AND WORLD CAPITAL OF MOBILE TELEPHONY

Another factor that makes the capital of Catalonia an ideal place to do ICT business is its extensive experience in organising ground-breaking technology events. Barcelona is second in the ICCA (International Congress & Convention Association) ranking regarding ideal cities to host conferences and professional meetings.

Barcelona hosts several ICT-related trade fairs, showing that it is both at the forefront of technology and a perfect destination to face tomorrow's challenges and initiate highly innovative projects.

- **World Mobile Congress:** The World Mobile Congress (MWC) is an annual fair, and a benchmark in the field of mobile telecommunications. Barcelona has hosted the WMC, organized by GSMA since 2006 and it will host until 2018.

- **Smart City Expo:** At the end of 2011 Barcelona hosted the first international fair of Catalan Smart Cities. This international trade fair shows the city's commitment to become a Smart City benchmark. On show will be latest technologies that can make cities more sustainable and efficient and that improve quality of life.

- **Bdigital Global Congress:** The Bdigital Global Congress, organised by Barcelona Digital, is an international benchmark congress for Catalonia that shows the latest ICT and applications for business, technology and society. The 13th edition held from 30 May to 2 June 2011 in Barcelona was attended by over 2,000 people and was focused on the Smart World.

Barcelona is organising other events in the ICT sector, such as NoCOName (a benchmark conference on computer security), Fòrum asLAN (Forum for technological solutions), the ITworldEdu (congress in the field of education) the BDigital Apps (a conference for specific applications and mobile solutions) or Gamelab (conference on games and entertainment), among others.

Barcelona, world capital of mobile telephony

Barcelona has been named the world capital of mobile telephony, which converts Barcelona into a vanguard city in terms of the mobile telephone business. Forecasts show that this will generate more than 270 million Euros for the city in the first year alone, plus thousands of part time jobs. As such, Barcelona will have a permanent exhibition centre featuring mobile technologies, new business, academic and cultural activities 365 days a year.

10.
IDEAL CITY FOR ICT BUSINESS

Thanks to its strategic location and excellent connections with the other countries in the European Union, the Mediterranean and Latin America, Barcelona is an ideal launch pad for new business ventures in Europe and markets in Latin America, North Africa and Middle East.

This dynamism and its ability to attract businesses and talent have all helped make Barcelona the 6th best placed city preferred for doing business, according to the European Cities Monitor ranking (Cushman & Wakefield, 2010-2011), leading other preferred locations in Spain.

More than 3,000 foreign companies in Catalonia have come from many different countries. In addition, 40% of these companies have operated their businesses in Catalonia for more than ten years, which shows the high degree of stability, satisfaction and return on investment that foreign companies enjoy.

Testimonials about Barcelona and its ICT sector:

"Barcelona 2020 shows how the Public Administration can work with private companies to drive growth and innovation. At Cisco we work side-by-side with the authorities in Europe, America and Asia to explore the economic and social opportunities that technology environments can generate in urban communities, and today's announcement puts Barcelona amongst the most pioneering cities around the world."

John Chambers
Cisco Chairman and CEO

"HP's Sant Cugat Centre has shown its professionalism, and capacity for internationalization and growth to become, once again, one of company's strategic points in Europe, the Middle East and Africa."

Santiago Morera
Managing Director of the Hewlett Packard Barcelona International Centre

"Inditex's 190-million Euro investment to enlarge its logistics plant in Tordera (Barcelona), from 2011 to 2015, will make it one the most technologically advanced textiles facilities in Europe."

Pablo Isla
Inditex vice president and CEO

Links

Education centres

EADA – Higher Business and Administration School
www.eada.edu

ESADE Business School
www.esade.edu

IESE Business School
www.iese.edu

UAB (Autonomous University of Barcelona)
www.uab.es

UB (University of Barcelona)
www.ub.es

UIC (International University of Catalonia)
www.unica.edu

UOC (Open University of Catalonia)
www.uoc.edu

UPC (Polytechnic University of Catalonia)
www.upc.es

UPF (Pompeu Fabra University)
www.upf.edu

URL (Ramon Llull University)
www.url.es

R&D&i knowledge transfer

Barcelona Digital Technology Centre
www.bdigital.org

Barcelona Media Innovation Centre
www.barcelonamedia.org

Catalonia Technology Centre (CTTC)
www.cttc.es

Fundacion i2cat
www.i2cat.net

CERCA Network
www.cerca.cat

TECNIO Network
www.acc10.cat/tecnio

Network of Science and Technology Parks of Catalonia (XPCAT)
www.xpcat.net

Local agencies

Barcelona City Council – Economy, Business and Employment Area
www.bcn.cat/barcelonabusiness

22@Barcelona
www.22barcelona.com

Barcelona Activa
www.barcelonactiva.cat

Localret
www.localret.es

Autonomous Region agencies

ACC10 (Support agency for Catalan business competitiveness)
www.acc10.cat

General Directorate for Telecomunications and the Information Society (DGTSI)
www.gencat.cat

State agencies

CDTI (Centre for Industrial Technology Development)
www.cdti.es

Ministry of Economy and Competitiveness
www.mineco.gob.es
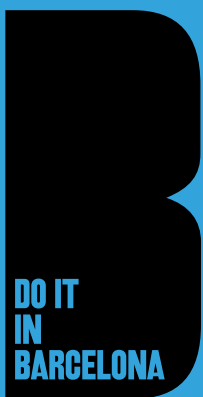
Ministry of Industry, Energy and Tourism
www.minetur.gob.es

Business entities

Barcelona Chamber of Commerce
www.cambrabcn.org

AMETIC (Spanish business leaders in the electronics, information technologies and digital content businesses)
www.ametic.es

SECARTYS (Spanish association for the internationalisation of the electronics, computing and telecommunications sectors)
www.secartys.org